Service Kit Instructions

Series 40 - M46

Neutral start switch spool replacement procedure

OVERVIEW

The rotary control spool in the M46 series variable pump wears with use, possibly causing controllability problems in certain applications. A new induction hardened control spool has been created that limits this wear. This procedure details the steps to replaced this control spool in M46 models that have the Neutral Start Switch (NSS) feature.

This procedure requires a spool replacement kit, Sauer-Danfoss part number 4510456. reference Sauer-Danfoss publication BLN-9939 (M46 Service Manual).

PRELIMINARY NOTES:

Thoroughly clean the pump control/NSS area of dirt and water. The introduction of foreign material (dirt, sand, or water) reduces the life and controllability of hydraulic systems.

⚠ Warning
Make sure prime mover (engine) is OFF.

There are two pump control adjustments affected by this procedure: pump neutral, and the neutral-start switch function. Follow the adjustment procedure for pump control neutral and NSS function, as outlined in the *Final Adjustments* section of this bulletin.

This procedure may be preformed with the pump in the vehicle. If there is less than 5 inches of clearance directly above the pump control assembly, the pump must be removed from the vehicle. If possible, the two pump mounting bolts may be removed, and the pump rotated to gain access.

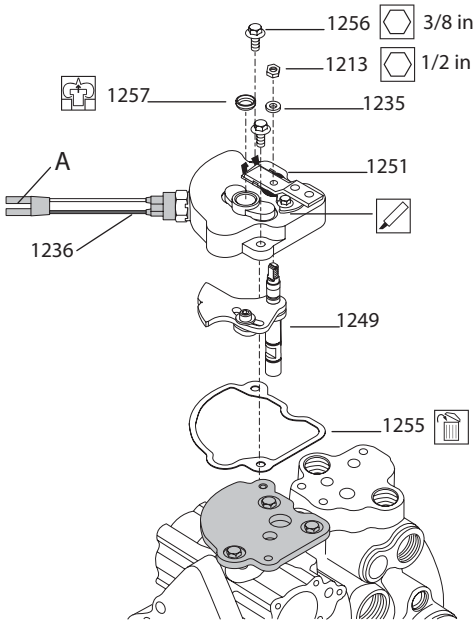
If equipped, shut the isolation valve in the pump suction line from the reservoir. Remember to reopen it before restarting the engine.

Ensure all parts of kit 4510456 are available and the new spool/cam assembly is properly assembled.

REMOVAL OF SPOOL

Removal of the pump neutral adjustment bracket is not necessary during this procedure. However, as a precaution, mark the position of the bracket.

1. Disconnect the NSS switch (1236) at the quick-disconnect (A).
2. With a 1/2 inch wrench, remove the control handle locknut (1213) and star-washer (1235).
3. With a 3/8 inch wrench, remove the two cover screws (1256)
4. Remove the NSS/spool assembly from the pump.
5. With a hammer, tap the spool/cam assembly (1249) from the NSS housing. Hold the control handle, spring, and neutral adjustment bracket in place during replacement of spool.
6. Remove the expansion plug (1257) by pressing it out from the inside.



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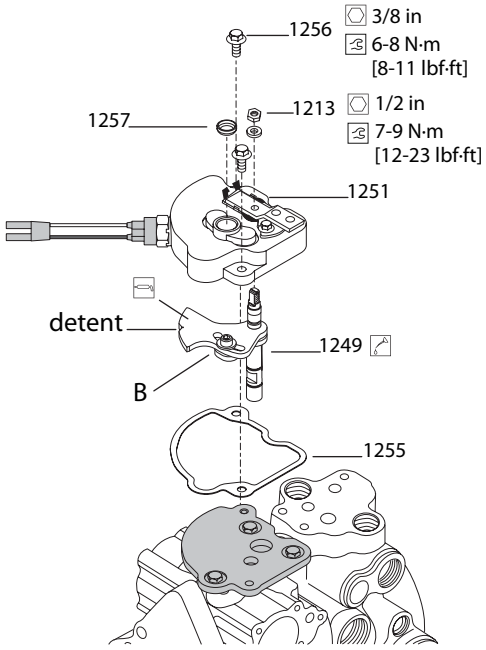
INSTALL THE NEW SPOOL

1. Apply grease inside the NSS housing, thoroughly coating the cam face.
2. Lubricate and insert the new spool assembly into the NSS housing (1251).
3. Install the star washer and finger-tighten the locknut onto the new spool.
4. Set the neutral cam with the neutral-start switch in the detent of the cam.
5. Set the new NSS housing gasket (1255) in place on the mounting plate.
6. Insert the control spool/NSS assembly on the pump.
7. Attach the cover with two screws (1256), torque to 6-8 N•m [8-11 lbf •ft]
8. Torque the spool locknut (1213) to 7-9 N•m [10-12 lbf•ft]



Check for free spool movement and spring-return function. It may be necessary loosen and retorque the screws to prevent binding of the control handle and spool. Do not tighten the neutral-start adjustment set screw (B) through the expansion plug hole until pump neutral is set (see final adjustments). If the control neutral is adjusted with the NSS screw tightened, the vehicle engine may not start.

FINAL ADJUSTMENTS

If the pump neutral adjustment bracket was not removed during this procedure, the pump will be in or very near the neutral set point with the new spool installed. However, do not assume the neutral set point is correct. Always check for control-neutral either with servo-pressure gauges or with the wheels-up method, before placing the vehicle back in service. See M46 Service Manual, BLN-9939 for more information.

W Warning
Unintended vehicle movement hazard
Protect yourself and bystanders from serious injury or death. Raise and secure the drive wheels off the ground or securely chock the wheels. Do not depend on the parking brake alone for protection.

1. Install 0-300 psi gauges in both servo test ports.
2. Loosen the washer head screw to allow the neutral adjustment bracket to move, but not freely.
3. Start the prime mover and slowly accelerate to normal operating speed.
4. Slowly rotate the neutral adjustment bracket until one of the servo gauges begins to increase pressure. Mark the position.
5. Slowly move the bracket in the opposite direction until the other gauge begins to increase pressure. Mark the position.
6. Rotate the bracket to a position at the midpoint between the marks and hold securely in place while torquing the washer head screw to 11-15 N·m [8-11 lbf·ft].
7. Stop the prime mover, remove the gauge and install the gauge port plugs.
8. Reinstall and adjust the control linkage, if necessary.

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